

CLAIM AMENDMENTS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1.-5. (Canceled)

6. (Currently Amended) A content reproducing apparatus for reading and reproducing a digital content that requires sequential reproduction and is recorded in a disk-shaped recording medium in a hard disk drive, comprising:

head position estimating means for estimating a present location ~~position~~ of a head with respect to the recording medium for reading a single file of the digital content;

data position calculating means for calculating a ~~position~~ location with respect to the recording medium of a data block for a digital content to be read next in chronological sequence in the single file, and chronological sequential positions and locations with respect to the recording medium of other data blocks existing sequentially before and sequentially after the data block in the single file;

the head position estimating means measures a time taken to execute a command for reading the data block and reflects the result of measurement on estimation of the location ~~position~~ of the head;

moving destination determining means for determining ~~[[a]]one of the respective data blocks~~ block at which the time required to move the head to is the shortest, ~~as a~~ and that the one of the respective data blocks is ~~block~~ to be read next in chronological sequence, based on the present location ~~position~~ of the head, which has been estimated by the head position estimating means, and the chronological sequential positions and locations of the respective data blocks, which have been calculated by the data position calculating means; and wherein

the moving destination determining means determines, based on a rotation latency necessary for the head to move on a track having predetermined data existing thereon and then for the recording medium to rotate to thereby cause the data to reach the location ~~position~~ of the head, a time required to move the head to the chronological sequential position and the location of the one of the respective ~~corresponding~~ data blocks ~~block~~.

7.-14. (Canceled)

15. (Currently Amended) A method of controlling a personal video recorder for reading and reproducing a digital video content recorded in a disk-shaped recording medium in a hard disk drive, comprising:

estimating ~~[[the]]~~a present position with respect to the recording medium, of a head for reading the digital video content, wherein a time taken to execute a command for reading the digital video content is measured, and the result of measurement is reflected on estimation of the position of the head:

calculating a position with respect to the recording medium of a data block for the digital video content to be read next, and positions with respect to the recording medium of other data blocks existing sequentially before and sequentially after the data block for rewind and fast operations, respectively, for displaying the digital video content on the personal video recorder;

calculating a time required to move the head to each of the individual respective data blocks, based on the estimated present position of head and the positions with respect to the recording medium of the respective data blocks; and

reading ~~[[a]]~~one of the respective data blocks ~~block~~ at which the calculated time required to move the head to is the shortest.

16. (Canceled)

17. (Currently Amended) A computer-readable non-transitory recording medium encoded with a software program for controlling a computer and performing control for reading and reproducing a digital video content recorded in a disk-shaped recording medium in a hard disk drive, for allowing the computer to execute the following processes:

a process for estimating ~~[[the]]~~a present location ~~position~~ with respect to the recording medium, of a head for reading a single file of the digital video content;

a process for calculating chronological sequential positions and locations with respect to the recording medium of a data block for the digital video content to be read next in the single file, and other data blocks existing sequentially before and sequentially after the data block in the single file for rewind and fast operations, respectively;

a process for calculating a time required to move the head to each of the locations of the respective data blocks, based on the estimated present position of the head and the chronological sequential positions and locations of the respective data blocks in the single file; and

a process for reading ~~[[a]]one of the respective data blocks block~~ at which the calculated time required to move the head is the shortest.

18. (Canceled)

19. (New) A method of controlling a personal video recorder for reading and reproducing a digital video content recorded in a disk-shaped recording medium in a hard disk drive, comprising:

estimating a present position with respect to the recording medium, of a head for reading the digital video content, wherein a time taken to execute a command for reading the digital video content is measured, and the result of measurement is reflected on estimation of the position of the head;

calculating a first position with respect to the recording medium of a first I frame to be read next, wherein the first I frame is in a first data block and the first I frame is a moving destination for the head;

calculating a second position with respect to the recording medium of a second I frame existing sequentially before the first I frame, wherein the second I frame is in a second data block;

calculating a third position with respect to the recording medium of a third I frame existing sequentially after the first I frame, wherein the third I frame is in a third data block;

calculating a first travel time required to move the head to the first I frame, based on the estimated present position of the head and the first position of the first I frame;

calculating a second travel time required to move the head to the second I frame, based on the estimated present position of the head and the second position of the second I frame;

calculating a third travel time required to move the head to the third I frame, based on the estimated present position of the head and the third position of the third I frame;

determining which of the first travel time, the second travel time, and the third travel time has a smallest travel time;

setting one of the first I frame, the second I frame, and the third I frame as the moving destination of the head, when on the smallest travel time is associated with the one of the first I frame, the second I frame, and the third I frame; and
reading data located at the moving destination.

20. (New) The method of claim 19 further comprising:

determining the second I frame existing sequentially before the first I frame; and
determining the third I frame existing sequentially after the first I frame.

21. (New) The method of claim 19 further comprising:

detecting a fast-forward reproduction prior to calculating the second position of the second I frame.

22. (New) The method of claim 19 further comprising:

detecting a fast-reverse reproduction prior to calculating the second position of the second I frame.

23. (New) The method of claim 19 wherein the first travel time, the second travel time, and the third travel time are based on a seek time for the head and a rotation latency of the recording medium.